Learning Theories – What Is Best For You and Your Classroom?

Question: "What are some key learning theories that you believe are useful for teaching Mathematics?"

When it comes to determining what key learning theories would be best to apply in the classroom, a teacher must look at themselves and assess what theory they personally would fit into. From there, they can implement those theories in the classroom. This, in my opinion, makes sense to do because one should stick to their strengths when they're teaching.

For example, if you believe Bloom's Taxonomy is *not* a style you personally learn well through, you won't be able to teachers others effectively using the same style. How can you possibly teach using techniques you do not fully work well with? If you're not yourself, students will see that and it will create an uncomfortable learning environment for everyone. To quote a famous Shakespeare play, "this above all; to thine own self be true."

Therefore, the following list of theories I have compiled (in no particular order) are theories I feel work best for my learning style and personality. It will be subjective to my personal beliefs and, thus, cannot be objectively viewed as right or wrong (but through sufficient statistical analysis, it could be proven effective or ineffective… However, I digress):

Theory #1 - ARCS Model of Motivational Design

Brief Description:

- The concept of ARCS Model of Motivational Design is to find promote and maintain motivation of learning through 4 steps:
    - **A**ttention: Gain the students interest through their curiosity, either by challenging them or by exposing them to the unknown
    - **R**elevance: Once interest is gained, maintaining that through connecting the material to its importance to the student ("What good is it for me today? Tomorrow?")
    - **C**onfidence: Giving the student the opportunity to build success through their own means, while still giving expectations to meet (challenges)
    - **S**atisfaction: The intrinsic reward the student will get from being successful in their endeavours, increasing self-worth and the motivation to do more

Why the Theory is Useful in Teaching Math:

- Giving the students the opportunity to create and build their own interest in Mathematics is much better than telling a student to learn it, like most people believe it is. Most people believe that they will never have to use 90% of the material they learn in Math, and as debatable as that may be, their initial dislike of it will "blind" their desire to learn it. As the old saying goes, "you can lead a horse to water, but you can't force it to drink." The ARCS Theory gives students a chance to discover a side of Math in a different light. Rather than be seen as something they're forced to do, their curiosity will lead them to see relevance. From there, they will continue to be motivated to learn through mastery, and the pleasure they will get from reaching that goal on their own could potentially motivate them to continue on that path.

Theory #2 - Problem-Based Learning (PBL)

Brief Description:

- Problem-Based Learning drives the focus on student discovery, and letting them investigate challenging, open-ended problems (either alone or in groups) where there is no definitive answer. Although the teacher's goal will be to facilitate and try to "bump" the students in the right direction, it will be the student's inquiries and thought process that will eventually lead them to the desired knowledge.

Why the Theory is Useful in Teaching Math:

- I believe this theory can be incredibly useful in teaching Math because it brings the students back to a time where all the answers to their Math problems could not be found in a textbook. There were no textbooks back then. Theorems were made by first discovering patterns from observing examples; and there was no set method of proving them. Mathematicians were allowed to make mistakes – something we frown at today, which isn't fair. Math is a form of Art that has been lost over time. Students should have the same chance to discover concepts in Math, instead of it being forced down their throat. They might enjoy it more. Heck, they might enjoy it.

Theory #3 - Schema Theory

Brief Description:

- A Schema is a framework or concept that helps organize information obtained by an individual into categories by its relationship to other bits of information. For example, when one is introduced to a classroom, anything they see in the classroom will be categorized with the classroom – teachers, books, tables, pencils, students, etc. It's a theory that tries to represent how we retain information; by "chunking" information that are connected together so it is easier to recall specific information later on, and anything that may relate to it. If you are able to connect new information to something in your schema, it's more likely to reach your long-term memory.

Why the Theory is Useful in Teaching Math:

- This theory is important in teaching math in a different way than my other theories. This theory has more to do with the content itself, and how it is taught. The curriculum, for the most part, does a very good job at trying to organize the content such that anything being taught is a building block for the next lesson. For example, you would be better off teaching students about quadratic equations before you can teach the quadratic formula – otherwise the quadratic formula is a trivial piece of information that cannot hold onto anything you've just learned, making it less likely to be retained in your long-term memory. So long as the material being taught has a logical progression (in this case, the material is being taught through prior knowledge), the student will have a better change of not only remembering the material, but recalling it later on for future use.

Theory #4 - Attribution Theory

Brief Description:

- Attribution Theory discusses how one perceives their successes and failures through multiple factors, the biggest being effort, ability, level of task difficulty and luck. The attribution dimension that are affected by these factors are:
    - Locus of Control (Internal vs. External): Determining if the outcome was due to internal factors or external factors (effort vs. luck, for example)
    - Stability: Determining whether the outcome will change over time or not
    - Controllability: Determining if any of those factors can be controlled for a desired result

Why the Theory is Useful in Teaching Math:

- When it comes to Mathematics, there are people that believe that they cannot do it because they don't possess the ability to do it like some others can, or that the material is too difficult. They immediately dismiss Math because they believe there are factors that they cannot change.
  Now, you may be asking yourself why I chose this theory then. I chose it because I believe being aware of these mindsets are the first issues that have to be addressed. You cannot motivate a student to learn something they instinctively believe they cannot do, whether it's something they can control or otherwise. Thus, finding ways to break that mentality is critical for student achievement. The goal is to maximize the internal factors for success ("I can do this because I understand it"), while limiting the external factors for failure ("I did not fail the test because of luck"). If this is achieved, then the motivation to continue learning Math will follow.
  There are some things that you cannot control (for example, winning a lottery or going on a date with Kate Beckinsale), but I do believe the ability to do well in Math is something you can control.

Learning Theories Concept Map

The Connection Between Theories…